

# What Is an Ecosystem?

Point Pelee National Park, located at the southernmost tip of Ontario, is one of the smallest national parks in Canada (Figure 1). Although the park covers only 15 km<sup>2</sup>, it contains many different types of plants and animals. Thousands of monarch butterflies stop and feed in the park before continuing their migration to Mexico in the fall (Figure 2). Many birds also stop in the park during migration. The park receives over 350 000 human visitors a year, all eager to discover its treasures. People visit from around the world to see the birds that come to the park each year.

To learn more about Point Pelee,

Go to Nelson Science

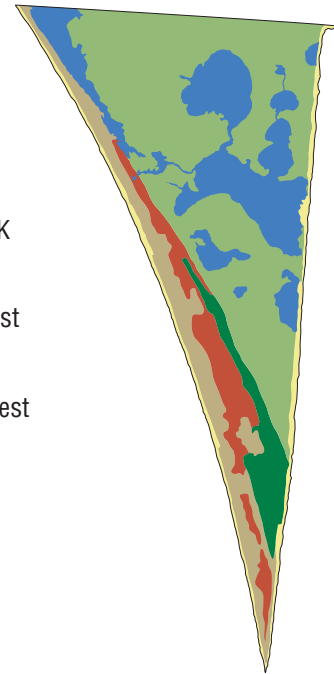


Point Pelee National Park



AREAS IN THE PARK

- water
- swamp forest
- beach
- dry land forest
- marsh
- savannah



**Figure 1** Point Pelee is a sand spit that juts out into Lake Erie.



**Figure 2** A monarch butterfly feeding before travelling south to Mexico

Why is Point Pelee so attractive to both wildlife and people? For wildlife, the park provides food and shelter. For humans, it is a place to watch birds, hike, and enjoy nature. This tiny area of land has a mixture of forests, woodland, and swamps. It also has an untouched marsh full of cattails, dragonflies, and other plants and animals. The beach area is home to hop trees and shorebirds. Finally, there are grasslands filled with milkweeds, wildflowers, birds (such as the savannah sparrow), and even prickly pear cacti. Like other parks throughout Ontario, Point Pelee is not only a place where living things can find food and shelter, but it is also a place where humans can learn more about nature.

## The Living Parts of the Environment

Living and non-living things can be found almost everywhere on Earth. The living parts of an environment, such as plants and animals, are **biotic elements**. Biotic elements in an environment affect one another. For example, the plants that grow in a particular environment will affect the survival of other living things. Living things are also known as **organisms**. Organisms that can only be seen with a microscope, such as bacteria and some algae, are known as **micro-organisms**.

Organisms that look similar to one another and that can mate to produce more of the same type of organism are called a **species**. An individual monarch butterfly is a member of the monarch butterfly species (Figure 3(a)). All the members of one species in an area are called a **population**. The thousands of monarch butterflies that fly to Point Pelee in the fall form a population (Figure 3(b)). When populations of different species live in the same area, they form a **community**. For example, the grassland community of Point Pelee includes the monarch butterfly population, as well as common milkweed, Eastern kingbird, and American coyote populations (Figure 3(c)). Each species within this community plays an important role.

**biotic element:** any living thing found in the environment

**organism:** a living thing

**micro-organism:** a living thing that is small and must be viewed with the help of a microscope

**species:** a group of similar organisms that can mate and reproduce more of the same type of organism

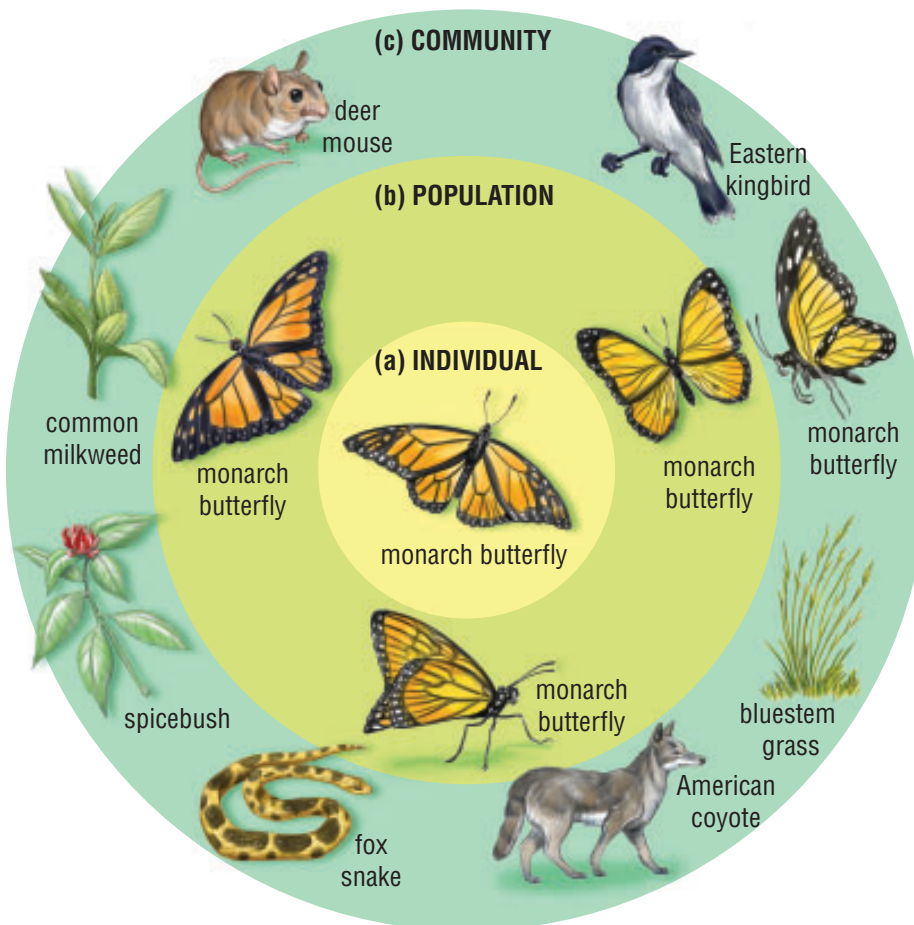
**population:** a group of organisms of the same species in a given area

**community:** a group of populations of different species in a given area

### LINKING TO LITERACY

#### Word Origins: Roots, Suffixes, and Prefixes

Knowing what words mean can help you to better understand science texts. For instance, the roots *bio-* and *biotic* mean “life.” When you read about biotic elements, you will know that these are living things. *Micro-* means “small,” therefore a micro-organism is a small organism. *Eco-* means “to do with the environment” and *-logy* refers to a field of study. See if you can use these terms to help define words found later in Section 4.1.



**Figure 3** This nested circle diagram shows how each individual of a species is part of a population, and each population is part of a community.

**abiotic element:** any non-living component of the environment

## The Non-Living Parts of the Environment

The non-living things in parts of an environment are **abiotic elements**. They include sunlight, air, rain, snow, sand dunes, rock, and water (Figure 4). Abiotic elements provide many of the things that organisms need to survive. Plants, for example, need air, water, and sunlight to grow.



**Figure 4** What abiotic elements on the beach of Point Pelee can you identify from this photo?

## Abiotic and Biotic Elements Interact to Form Ecosystems

The biotic elements in an environment constantly interact with each other and with the abiotic elements of the environment. A fox snake eating an Eastern mole is an example of an interaction between two biotic elements. Wind that changes the shapes of sand dunes on the beach is an interaction between two abiotic elements. A sunfish making its nest on the bottom of a marsh is an interaction between a biotic and an abiotic component of the marsh. The interactions among the biotic and abiotic parts of an environment are called an **ecosystem**. The grasslands, beach, and marsh and the living things in these areas form different ecosystems in Point Pelee.

An ecosystem can be large or small, but the abiotic and biotic parts always interact. For example, a rotting log is an ecosystem. All the organisms living in, or on, the log interact with each other and with the log itself. A forest is also an ecosystem, but it is large. It is made up of all the organisms living in it and the abiotic elements of the forest that affect them.

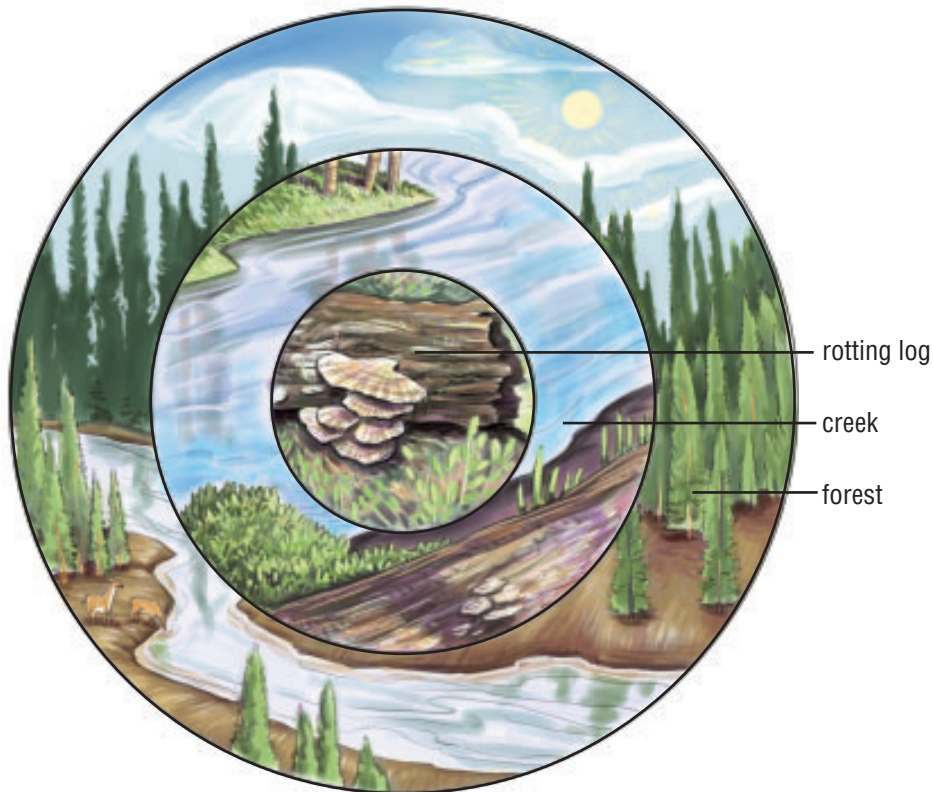
**ecosystem:** the network of interactions that link the living and non-living parts of an environment



A large ecosystem often contains many smaller ecosystems (Figure 5). All the ecosystems that exist within a larger ecosystem are interconnected. For example, a deer that lives in a forest ecosystem might get its water from a creek ecosystem.

The study of relationships between living things, non-living things, and their environment is called **ecology**.

**ecology:** the study of relationships between organisms, and between organisms and their environment



**Figure 5** Ecosystems often contain smaller ecosystems.

Humans are also part of ecosystems. Visitors entering Point Pelee (Figure 6) may accidentally introduce things into the environment, such as trash, or they may tread on plants by mistake. Visitors may also scare away animals by making too much noise. People may also bring seeds, plant parts, and insects into ecosystems on their shoes or clothing. This can introduce new species. You will learn more about introduced species in Chapter 6.

**Unit Task** Ecosystems have abiotic and biotic elements that interact. How can this knowledge help you with the Unit Task?



**Figure 6** Humans can affect the ecosystems that they interact with.

## ✓ CHECK YOUR LEARNING

1. Draw diagrams of some of the living and non-living elements of Point Pelee. Draw lines to indicate the interactions between the living and non-living parts. Describe those interactions.
2. Describe in your own words the difference between species, population, and community. Give examples.
3. Name three human interactions that may happen in an environment such as Point Pelee.
4. Explain how a rotting log can be an ecosystem.
5. Give an example of a smaller ecosystem existing within a larger ecosystem.